

WHAT IS CLAIMED:

1. A method of preparing a lithographic fountain solution, comprising the step of:
proportioning at least two liquid concentrates comprising components of the fountain solution into a water source within a mixing apparatus to form the fountain solution.
2. The method of Claim 1, wherein the proportioning step comprises proportioning a first and second liquid concentrate into the water source; the first liquid concentrate comprising a water-soluble film-forming polymer and one or more organic acids; and the second liquid concentrate comprising a diluent, solvent and surfactant; the diluent selected from the group consisting of water-soluble glycols, glycol ethers and a combination thereof; and the solvent selected from the group consisting of partially water-soluble glycols, ethers, esters, alcohols, and combinations thereof.
3. The method of Claim 1, wherein the liquid concentrates comprise less than about 30 % by wt water.
4. The method of Claim 1, wherein the second liquid concentrate comprises less than about 10 % by wt water.
5. The method of Claim 1, wherein the concentrates are proportioned into the water source at about 0.1-2 % by volume.
6. The method of Claim 2, wherein the second liquid concentrate comprises a nonionic surfactant.
7. The method of Claim 2, wherein the mixing apparatus comprises a proportioning pump comprising an inlet for the first concentrate, an inlet for the second concentrate, an inlet for the water source, an outlet for dispensing the fountain solution, and a motor piston connected to first and second metering pistons; wherein movement of the motor piston meters water into the

apparatus and causes movement of the first and second metering pistons to meter a proportion of the first and second concentrates into the water within the pump; and

the step of proportioning the at least two liquid concentrates comprises operating the proportioning pump to meter the concentrates into the water in the pump.

8. A method of preparing a lithographic fountain solution, comprising the steps of:
continuously metering a flow of each of at least first and second liquid concentrates comprising components of the fountain solution into a mixing chamber of a mixing apparatus in predetermined proportions; and
flowing a water source into the mixing chamber to dilute the liquid concentrates to form the fountain solution.

9. The method of Claim 8, wherein the liquid concentrates comprise less than about 30 % by wt water.

10. The method of Claim 8, wherein the first liquid concentrate comprises a water-soluble film-forming polymer and one or more organic acids; and the second liquid concentrate comprises a diluent, solvent and surfactant.

11. The method of Claim 8, comprising the steps of:
monitoring at least one of pH, conductivity, and surface tension of the fountain solution;
and
adjusting the proportion of the first or second liquid concentrate metered into the mixing chamber to alter one or more of the pH, conductivity, and surface tension of the fountain solution.

12. The method of Claim 11, wherein the step of adjusting comprises increasing the proportion of the first liquid concentrate to decrease the pH of the fountain solution to about pH 2-6.

13. The method of Claim 11, wherein the step of adjusting comprises altering the proportion of the second liquid concentrate to alter the surface tension of the fountain solution.

14. The method of Claim 13, wherein the step of adjusting comprises increasing the proportion of the second liquid concentrate to decrease the surface tension of the fountain solution to about 38-45.

15. The method of Claim 11, wherein the step of adjusting comprises altering the proportion of the first liquid concentrate to alter the conductivity of the fountain solution.

16. The method of Claim 15, wherein the step of adjusting comprises increasing the proportion of the first liquid concentrate to increase the conductivity of the fountain solution to about 1000 to about 4000 micromhos/cm.

17. A method of preparing a lithographic fountain solution, comprising the steps of:
providing a flow of water into a proportioning apparatus;
providing a flow of a first liquid concentrate comprising film-forming components of the fountain solution into the water flow; and
providing a flow of a second liquid concentrate comprising wetting components of the fountain solution into the water flow to mix with the first liquid concentrate and form the fountain solution.

18. The method of Claim 17, wherein the liquid concentrates comprise less than about 30 % by wt water.

19. The method of Claim 17, wherein the concentrates are proportioned into the water source at about 0.1-2 % by volume.

20. A method of preparing a fountain solution, comprising the steps of:
continuously metering proportions of first and second liquid concentrates into a water flow to form the fountain solution; the first liquid concentrate comprising a film-forming

water-soluble polymer, organic acid, and less than about 30 % by wt water; and the second liquid concentrate component comprising a wetting agent and less than about 10 % by wt water; the fountain solution comprising a predetermined concentration of the first and second liquid concentrates.

21. The method of Claim 20, wherein the fountain solution comprises about 1-30 % by wt of the first liquid concentrate, about 1-30 % by wt of the second liquid concentrate, and about 50-90 % by wt water.

22. A method of preparing a fountain solution, comprising the steps of:

providing a mixing apparatus comprising a dual action proportioning pump comprising an inlet for a first liquid concentrate, an inlet for a second liquid concentrate, an inlet for a water source, an outlet for dispensing the fountain solution, a motor piston connected to first and second metering pistons; wherein movement of the motor piston meters water into the apparatus, and causes movement of the first and second metering pistons to meter a proportion of the first and second concentrates into the water within the pump; and

operating the motor piston of the proportioning pump to continuously meter water into the pump and move the metering pistons to meter proportions of the first and second liquid concentrates into the water in the pump to form the fountain solution.

23. The method of Claim 22, wherein the liquid concentrates comprise less than about 30 % by wt water.

24. The method of Claim 22, wherein the first and second concentrates are metered into the water at about 0.1-2 % by volume.

25. The method of Claim 22, further comprising:

providing the first liquid concentrate comprising a film-forming water-soluble polymer, organic acid and less than about 30 % by wt water; and the second liquid concentrate component comprising a wetting agent and less than about 10 % by wt water.

26. A system for preparing a fountain solution, comprising;
a source of a first liquid concentrate comprising a film-forming water-soluble polymer, organic acid, and less than about 30 % by wt water;
a source of a second liquid concentrate comprising a wetting agent of the fountain solution, and less than about 10 % by wt water;
a source of water; and
an apparatus operable for metering a proportion of a stream of each of the first and second liquid concentrates into a stream of the water to form the fountain solution.
27. The system of Claim 26, wherein the apparatus is operable to meter about 0.1-2 % by volume of the first and second concentrates into the water.
28. The system of Claim 26, wherein the metering apparatus comprises a proportioning pump comprising an inlet for the first concentrate, an inlet for the second concentrate, an inlet for the water source, an outlet for dispensing the fountain solution, and a motor piston connected to first and second metering pistons; wherein movement of the motor piston meters water into the apparatus, and causes movement of the first and second metering pistons to meter a proportion of the first and second concentrates into the water within the pump.
29. The system of Claim 26, wherein the metering apparatus comprises a conduit for discharging the fountain solution therefrom, and the system further comprises a container for receiving and holding the discharged fountain solution.
30. The system of Claim 29, wherein the container comprises a recirculating tank.
31. The system of Claim 26, further comprising at least one measuring device in contact with the fountain solution, the measuring device selected from the group consisting of a pH probe, a conductivity probe, and a surface tension probe.
32. The system of Claim 26, wherein a device for controlling the proportion of the first liquid concentrate, the second liquid concentrate, or both, metered into the stream of the water, is

connected to the measuring device and operably responsive to the output measurement of the pH, the conductivity, or the surface tension to adjust the proportion of the first or the second liquid concentrate metered into the stream of the water when a value of the output measurement deviates from a predetermined value.

33. A liquid concentrate solution for preparing a fountain solution, comprising:
one or more water-soluble film-forming polymers, one or more organic acids, and up to about 30 % by wt water.
34. The solution of Claim 33, further comprising one or more inorganic acids or salts thereof, a buffering agent, or a combination thereof.
35. The solution of Claim 33, wherein the water-soluble film-forming polymer is selected from the group consisting of gums, starch derivatives, complex sugars, alginates, cellulose derivatives, and combinations thereof.
36. The solution of Claim 33, further comprising a water-soluble glycol solvent, biocide, desensitizing agent, chelating agent, dye, or combinations thereof.
37. The solution of Claim 36, wherein the water-soluble glycol solvent is selected from the group consisting of glycerine, C₂ to C₆ glycols, polyglycols, and combinations thereof.
38. The solution of Claim 33, comprising about 10-60 % by wt film-forming polymer, about 5-50 % by wt organic acid, about 5-50 % by wt inorganic acid, and about 5-30 % by wt buffering agent.
39. The solution of Claim 38, further comprising about 1-50 % by wt of water-soluble glycol solvent, about 1-5 % by wt biocide, about 5-30 % by wt desensitizing agent, about 0.1-10 % by wt chelating agent, about 0-1% by wt dye, or a combination thereof.

40. A liquid concentrate solution for preparing a fountain solution, comprising:
one or more water-soluble film-forming polymers, one or more organic acids, and up to about 30 % by wt water, the water being derived from ingredient components.
41. A liquid concentrate solution for preparing a fountain solution, comprising:
one or more diluents, one or more solvents, and one or more surfactants, and up to about 10 % by wt water.
42. The solution of Claim 41, wherein the diluent is selected from the group consisting of water-soluble glycols, glycol ethers and a combination thereof.
43. The solution of Claim 41, wherein the solvent is selected from the group consisting of partially water-soluble glycols, ethers, esters, alcohols, and combinations thereof.
44. The solution of Claim 43, wherein the surfactant comprises a nonionic surfactant.
45. The solution of Claim 44, wherein the surfactant is selected from the group consisting of acetylenic glycols, alkyl pyrrolidones, propylene oxide/ethylene oxide block copolymers, alcohol ethoxylates, silanes, aryl ethoxylates, esters of fatty acids, and combinations thereof.
46. The solution of Claim 41, comprising up to about 80 % by wt diluent selected from the group consisting of glycols, water-soluble glycol ethers, or combination thereof; about 1-25 % by wt solvent selected from the group consisting of partially water-soluble glycol ether, ester, glycol, alcohol, or combination thereof; and about 1-50 % by wt surfactant.
47. The solution of Claim 41, further comprising a biocide, dye, defoaming agent, dosage marker, or combination thereof.
48. The solution of Claim 41, further comprising an aromatic sulfonate, an alkyl sulfate, or a combination thereof.

49. A liquid concentrate solution for preparing a fountain solution, comprising:
one or more diluents, one or more solvents, one or more surfactants, and up to about 10 % by wt water, the water being derived from ingredient components.
50. An article of manufacture for preparing a fountain solution, comprising:
first and second liquid concentrates each separately contained and packaged together; the first liquid concentrate comprising one or more water-soluble film-forming polymers and organic acids, and up to about 30 % by wt or less water; and the second liquid concentrate comprising one or more diluents, solvents and surfactants, and up to about 10 % by wt or less of water.
52. The article of manufacture of Claim 50, further comprising:
an apparatus operable for delivering a proportion of each of the first and second liquid concentrates into water to form the fountain solution.
53. The article of manufacture of Claim 52, wherein the apparatus is operable to meter about 0.1-2 % by volume of the first and second concentrates into the water.
54. The article of manufacture of Claim 50, wherein the metering apparatus comprises a proportioning pump comprising an inlet for the first concentrate, an inlet for the second concentrate, an inlet for the water source, an outlet for dispensing the fountain solution, and a motor piston connected to first and second metering pistons; wherein movement of the motor piston meters water into the apparatus, and causes movement of the first and second metering pistons to meter a proportion of the first and second concentrates into the water within the pump.
55. The article of manufacturing of Claim 50, further comprising, packaged with the first and second concentrations, a device operable to monitor a parameter of the fountain solution or concentrates selected from the group consisting of pH, conductivity, surface tension, and combinations thereof.